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FEE TRANSMITTAL for FY 2000

Patent fees are subject to annual revision.

TOTAL AMOUNT OF PAYMENT (\$) 808.00

Complete if Known

Application Number	
Filing Date	
First Named Inventor	Wen-Shi Huang
Examiner Name	
Group Art Unit	
Attorney Docket No.	00766

METHOD OF PAYMENT (check one)

1. ☒ The Commissioner is hereby authorized to charge indicated fees and credit any overpayments to:

Deposit Account Number: 11-1110
Deposit Account Name: Kirkpatrick & Lockhart LLP

☒ Charge Any Additional Fee Required Under 37 CFR 1.16 and 1.17

☐ Applicant claims small entity status. See 37 CFR 1.27

2. ☒ Payment Enclosed:

☒ Check ☐ Credit card ☐ Money Order ☐ Other

FEE CALCULATION

1. BASIC FILING FEE

Large Entity		Small Entity		Fee Description	Fee Paid
Fee Code (\$)	Fee Code (\$)	Fee Code (\$)	Fee Code (\$)		
101	690	201	345	Utility filing fee	690.
106	310	206	155	Design filing fee	
107	480	207	240	Plant filing fee	
108	690	208	345	Reissue filing fee	
114	150	214	75	Provisional filing fee	

SUBTOTAL (1) (\$) 690.00

2. EXTRA CLAIM FEES

Total Claims	Extra Claims	Fee from below	Fee Paid
12	-20** = 0	0	0
4	-3** = 1	78.	78.
Multiple Dependent			

**or number previously paid, if greater. For Reissues, see below

Large Entity		Small Entity		Fee Description
Fee Code (\$)	Fee Code (\$)	Fee Code (\$)	Fee Code (\$)	
103	18	203	9	Claims in excess of 20
102	78	202	39	Independent claims in excess of 3
104	260	204	130	Multiple dependent claim, if not paid
109	78	209	39	** Reissue independent claims over original patent
110	18	210	9	** Reissue claims in excess of 20 and over original patent

SUBTOTAL (2) (\$) 78.00

FEE CALCULATION (continued)

3. ADDITIONAL FEES

Large Entity		Small Entity		Fee Description	Fee Paid
Fee Code (\$)	Fee Code (\$)	Fee Code (\$)	Fee Code (\$)		
105	130	205	65	Surcharge - late filing fee or oath	
127	50	227	25	Surcharge - late provisional filing fee or cover sheet	
139	130	139	130	Non-English specification	
147	2,520	147	2,520	For filing a request for ex parte reexamination	
112	920*	112	920*	Requesting publication of SIR prior to Examiner action	
113	1,840*	113	1,840*	Requesting publication of SIR after Examiner action	
115	110	215	55	Extension for reply within first month	
116	380	216	190	Extension for reply within second month	
117	870	217	435	Extension for reply within third month	
118	1,360	218	680	Extension for reply within fourth month	
128	1,850	228	925	Extension for reply within fifth month	
119	300	219	150	Notice of Appeal	
120	300	220	150	Filing a brief in support of an appeal	
121	260	221	130	Request for oral hearing	
138	1,510	138	1,510	Petition to institute a public use proceeding	
140	110	240	55	Petition to revive - unavoidable	
141	1,210	241	605	Petition to revive - unintentional	
142	1,210	242	605	Utility issue fee (or reissue)	
143	430	243	215	Design issue fee	
144	580	244	290	Plant issue fee	
122	130	122	130	Petitions to the Commissioner	
123	50	123	50	Petitions related to provisional applications	
126	240	126	240	Submission of Information Disclosure Stmt	
581	40	581	40	Recording each patent assignment per property (times number of properties)	40.00
146	690	246	345	Filing a submission after final rejection (37 CFR § 1.129(a))	
149	690	249	345	For each additional invention to be examined (37 CFR § 1.129(b))	
179	690	279	345	Request for Continued Examination (RCE)	
169	900	169	900	Request for expedited examination of a design application	

Other fee (specify) _____

*Reduced by Basic Filing Fee Paid

SUBTOTAL (3) (\$) 40.00

SUBMITTED BY

Name (Print/Type)	Christine R. Ethridge	Registration No. (Attorney/Agent)	30,557	Telephone	(412) 355-8619
Signature	<i>Christine R. Ethridge</i>	Date	10 October 2000		

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MAGNETIZING STRUCTURE OF MOTOR

FIELD OF THE INVENTION

The present invention relates to a magnetizing structure of a motor,
5 and more particularly to a structure for magnetizing a rotor magnet or a
stator magnet of a direct current motor.

BACKGROUND OF THE INVENTION

A traditional direct current motor essentially comprises two major
components: a rotor and a stator, one of which is made of permanent
10 magnet and the other is an electric magnet, and the one is disposed
circumferentially by the other. Between a rotor and a stator, there exists
an air gap. In one case, an inner rotor rotates within a stator; in another
case, an outer rotor rotates around an inner stator. A permanent magnet
incorporated on either a rotor or a stator directs a magnetic field into the
15 air gap, which interacts with another magnetic field of changing polarity
to develop the torque for driving a motor.

Fig. 1 shows a magnetizing structure that is commonly found in a
motor. Such structure of an outer-rotor type motor includes a rotor 12
having a magnet cylinder 121 with smooth surfaces on both sides and a
20 stator 11 having a plurality of silicon steel sheets 111 wound by a
plurality of winding coils 13. When a current is applied to a winding
coil, an electric magnetic field is created to repulse the magnetic field
caused from the permanent magnet, thereby the rotor rotates and drives
an article such as a fan.

25 The permanent magnet is usually in a shape of cylinder; therefore,
the term "magnet cylinder" hereinafter means a cylindrical-shaped
magnet, unless otherwise specified.

15 Therefore, the present invention provides an improved magnetizing
structure for overcoming the problems described above.

SUMMARY OF THE INVENTION

An object of the present invention is to provide a structure for magnetizing a rotor magnet of a motor, which includes a rotor having a magnet cylinder with a wavy curve surface and a stator having a plurality of silicon steel sheets wound by a plurality of winding coils.

Preferably, the wavy curve surface of the magnet cylinder is one of an inner wavy curve surface and an outer wavy curve surface.

Preferably, the wavy curve surface of the magnet cylinder includes a
25 plurality of curve surfaces having different arc centers.

The plurality of silicon steel sheets can be symmetric or asymmetric; preferably, they are symmetrical.

According to another aspect of the present invention, there is provided a structure for magnetizing a stator magnet of a motor, which includes a stator having a magnet cylinder with a wavy curve surface and a rotor having a plurality of silicon steel sheets wound by a plurality of winding coils.

Certainly, the wavy curve surface of the magnet cylinder can be one of an inner wavy curve surface and an outer wavy curve surface.

10 The wavy curve surface of the magnet cylinder includes a plurality of curve surfaces having different arc centers. The plurality of silicon steel sheets is preferably symmetrical.

According to a further aspect of the present invention, there is provided a structure for magnetizing a rotor magnet of a motor, which includes a rotor having a magnet cylinder with a lumpy edge and a stator having a plurality of silicon steel sheets wound by a plurality of winding coils. The lumpy edge is a combination of a plurality of concave surfaces and a plurality of convex surfaces.

According to a still further aspect of the present invention, there is provided a structure for magnetizing a stator magnet of a motor, which includes a stator having a magnet cylinder with a lumpy edge and a rotor having a plurality of silicon steel sheets wound by a plurality of winding coils. The lumpy edge is a combination of a plurality of concave surfaces and a plurality of convex surfaces..

25 The above objects and advantages of the present invention will become more readily apparent to those ordinarily skilled in the art after reviewing the following detailed description and accompanying

drawings, in which:

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a sectional view showing a magnetizing structure of motor according to prior art;

- 5 Fig. 2 is a sectional view showing a structure for magnetizing of a rotor having a magnet cylinder with an inner wavy curve according to the first preferred embodiment of the present invention;

Fig. 3 is a sectional view showing a structure for magnetizing a rotor having a magnet cylinder with an outer wavy curve according to the first
10 preferred embodiment of the present invention;

Fig. 4 is a sectional view showing a structure for magnetizing a stator having a magnet cylinder with an outer wavy curve according to the second preferred embodiment of the present invention; and

- Fig. 5 is a perspective view showing a structure for magnetizing a rotor
15 having a magnet cylinder with a lumpy edge according to the third preferred embodiment of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

- Referring to Fig. 2, the first preferred embodiment of the present invention provides a structure for magnetizing a rotor magnet, which
20 includes a rotor having a magnet cylinder 22 with an inner wavy curve surface 25 and a stator 21 having a plurality of silicon steel sheets 24 wound by a plurality of winding coils 23. The silicon steel sheets 24 are symmetrical, which facilitates mass production to reduce cost. Since the magnet cylinder 22 is manufactured by a molding and sintering
25 process, the shape or size of it can be predetermined and the cost is not high. Owing to the inner wavy curve surface 25, the magnet cylinder 22 directs a magnetic field into the air gap for interacting with the

inductive magnetic field easily to develop the torque and radiate the internally generated heat.

The structure for magnetizing a rotor magnet shown in Fig. 3 is the same as that in Fig. 2, except that a rotor having a magnet cylinder 22
5 with an outer wavy curve surface 39.

Referring to Fig. 4, the second preferred embodiment of the present invention provides a structure for magnetizing a stator magnet, which includes a stator having a magnet cylinder 40 with an outer wavy curve surface 45 and a stator 41 having a plurality of silicon steel sheets 42
10 wound by a plurality of winding coils 43. Certainly, the outer wavy curve surface can be replaced with an inner wavy curve surface.

Referring to Fig. 5, the third preferred embodiment of the present invention provides a structure for magnetizing a rotor magnet. The structure in Fig. 5 is the same as that in Fig. 2, except that the rotor has a
15 magnet cylinder with a lumpy edge which is a combination of a plurality of concave surface 52 and a plurality of convex surfaces 51. Certainly, a structure for magnetizing a stator magnet is also suitable, wherein the stator has a magnet cylinder with a lumpy edge which is a combination of a plurality of concave surfaces and a plurality of convex surfaces.

20 As will be apparent from the above description according to the present invention, the improved magnetized structure for magnetizing a rotor magnet or a stator magnet of a direct current motor is suitable to start a motor easily, radiate the internally generated heat quickly and prevent the locked rotor condition.

25 While the invention has been described in terms of what are presently considered to be the most practical and preferred embodiments, it is to be understood that the invention needs not be limited to the

WHAT IS CLAIMED IS:

1. A structure for magnetizing a rotor magnet of a motor, comprising :
a rotor having a magnet cylinder with a wavy curve surface; and
a stator having a plurality of silicon steel sheets wound by a plurality
5 of winding coils.
2. A structure of Claim 1, wherein said wavy curve surface of the
magnet cylinder is one of an inner wavy curve surface and an outer
wavy curve surface.
3. A structure of Claim 2, wherein said wavy curve surface of said
10 magnet cylinder includes a plurality of curve surfaces having different
arc centers.
4. A structure of Claim 1, wherein said plurality of silicon steel sheets is
symmetrical.
5. A structure for magnetizing a stator magnet of a motor, comprising :
15 a stator having a magnet cylinder with a wavy curve surface; and
a rotor having a plurality of silicon steel sheets wound by a plurality of
winding coils.
6. A structure of Claim 5, wherein said wavy curve surface of said
magnet cylinder is one of an inner wavy curve surface and an outer
20 wavy curve surface.
7. A structure of Claim 6, wherein said wavy curve surface of said
magnet cylinder includes a plurality of curve surfaces having different
arc centers.
8. A structure of Claim 5, wherein said plurality of silicon steel sheets is
25 symmetrical.
9. A structure for magnetizing a rotor magnet, comprising : a rotor
having a magnet cylinder with a lumpy edge; and

a stator having a plurality of silicon steel sheets wound by a plurality of winding coils.

10. A structure of Claim 9, wherein the structure of said lumpy edge is a combination of a plurality of concave surfaces and a plurality of convex surfaces.
11. A structure for magnetizing a stator magnet, which includes a stator having a magnet cylinder with a lumpy edge and a rotor having a plurality of silicon steel sheets wound by a plurality of winding coils.
12. A structure of Claim 11, wherein the structure of said lumpy edge is a combination of a plurality of concave surfaces and a plurality of convex surfaces.

MAGNETIZING STRUCTURE OF MOTOR

ABSTRACT OF THE DISCLOSURE

The present invention provides a structure for magnetizing a rotor
5 magnet of a motor, which includes a rotor having a magnet cylinder with
a wavy curve surface and a stator having a plurality of silicon steel
sheets wound by a plurality of winding coils. The present invention
also provides a structure for magnetizing a stator magnet of a motor,
which includes a stator having a magnet cylinder with a wavy curve
10 surface and a rotor having a plurality of silicon steel sheets wound by a
plurality of winding coils.

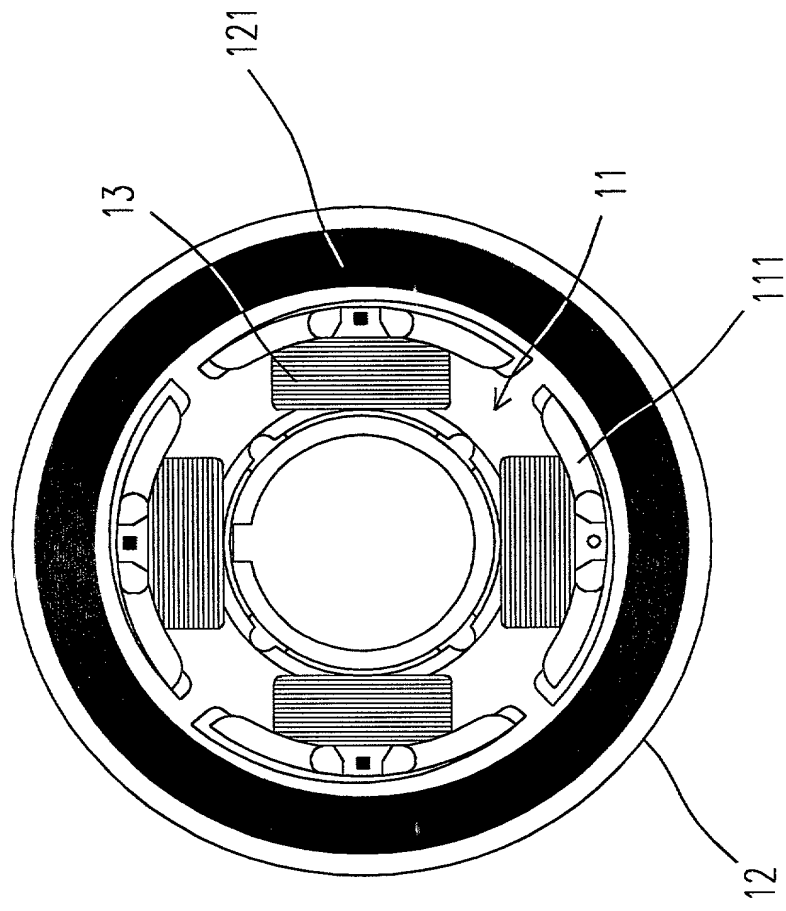


Fig. 1(PRIOR ART)

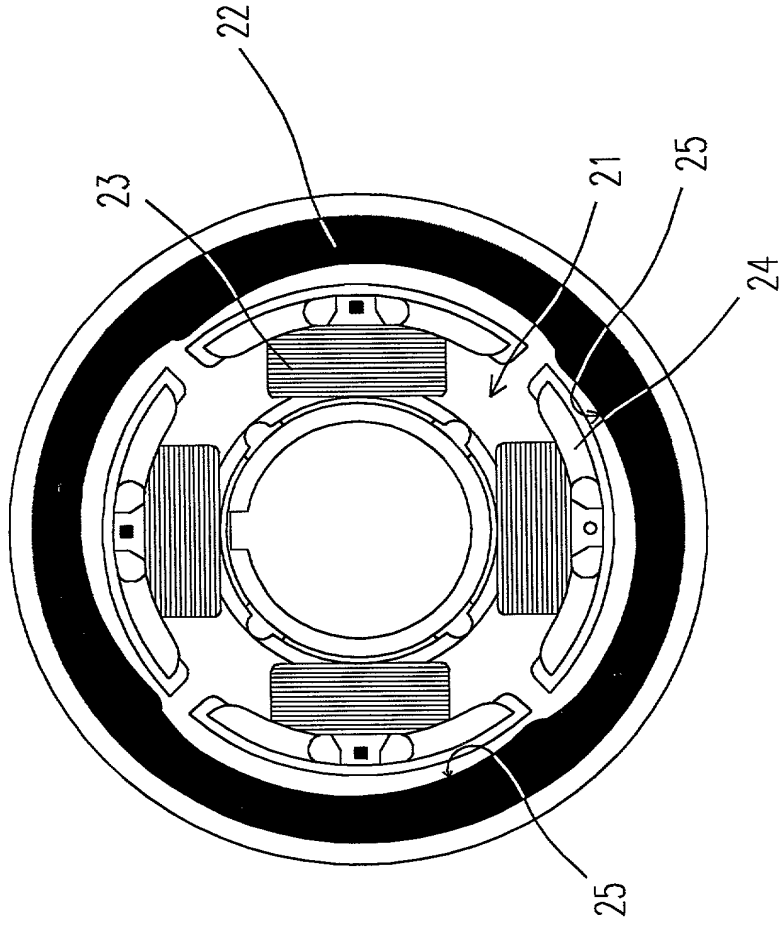


Fig. 2

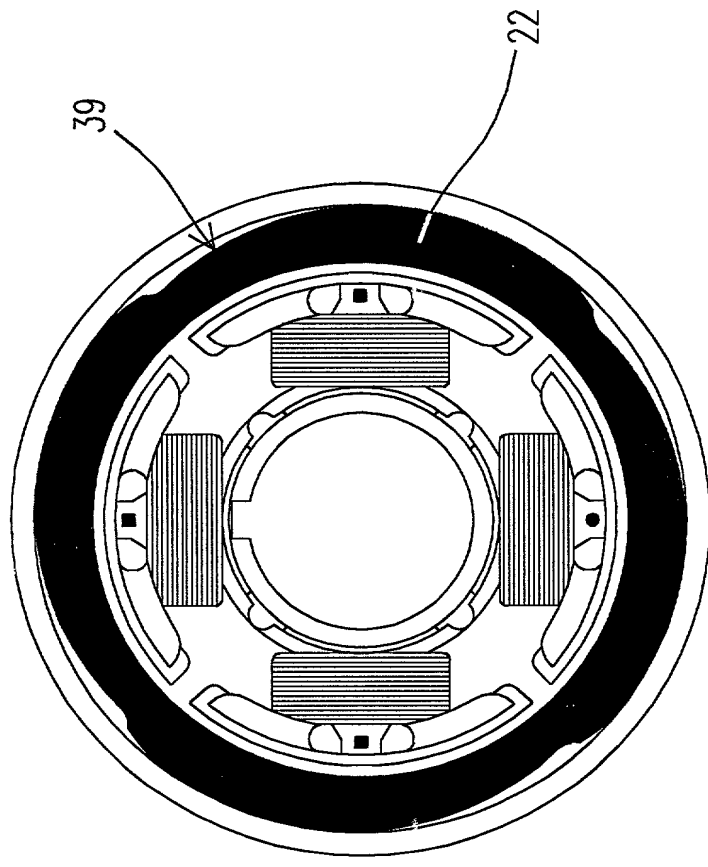


Fig. 3

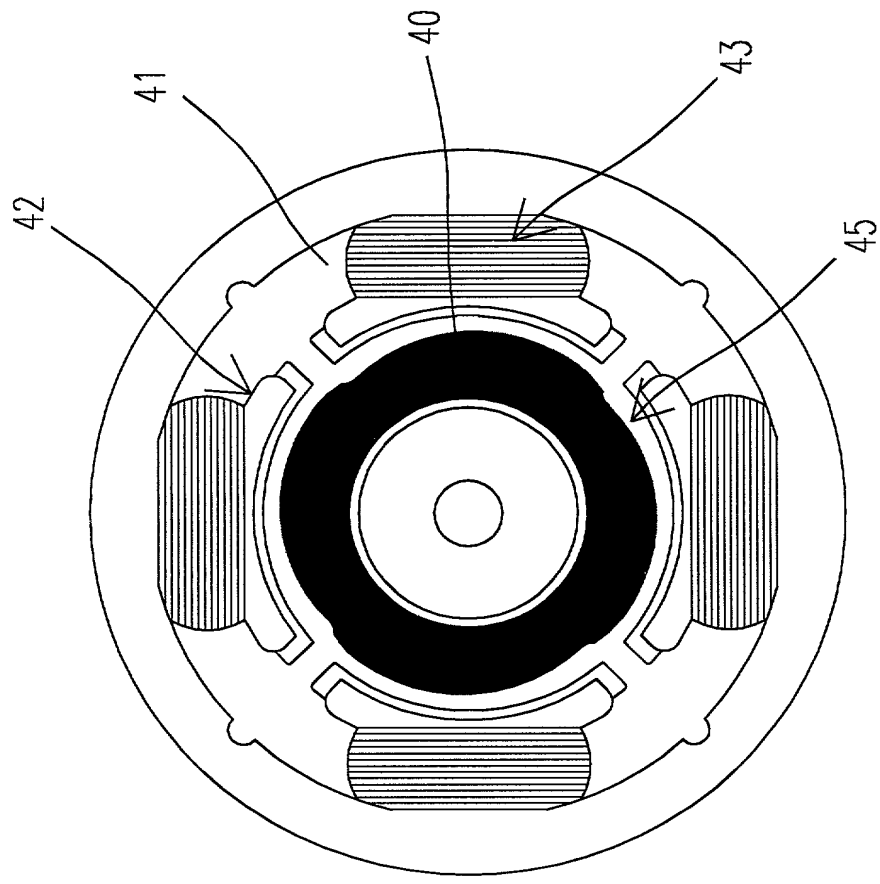


Fig. 4

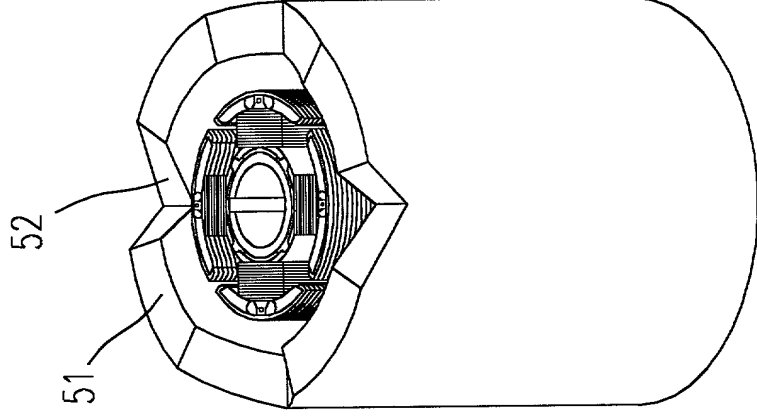


Fig. 5

Declaration and Power of Attorney For Patent Application

English Language Declaration

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I verily believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

MAGNETIZING STRUCTURE OF MOTOR
the specification of which

(check one)

☒ is attached hereto.

☐ was filed on _____ as
Application Serial No. _____
and was amended on _____
(if applicable)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose to the Office all information known to me to be material to the patentability of this application in accordance with Title 37, Code of Federal Regulations, § 1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, § 119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s)			Priority Claimed	
<u>88217381</u>	<u>Taiwan</u>	<u>13/October/1999</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
(Number)	(Country)	(Day/Month/Year Filed)	Yes	No
<u> </u>	<u> </u>	<u> </u>	<input type="checkbox"/>	<input type="checkbox"/>
(Number)	(Country)	(Day/Month/Year Filed)	Yes	No
<u> </u>	<u> </u>	<u> </u>	<input type="checkbox"/>	<input type="checkbox"/>
(Number)	(Country)	(Day/Month/Year Filed)	Yes	No

I hereby claim the benefit under Title 35, United States Code, § 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of title 35, United States Code, § 112, I acknowledge the duty to disclose to the Office all information known to me to be material to patentability of the application as defined in Title 37, Code of Federal Regulations, § 1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

(Application Serial No.)

(Filing Date)

(Status)
(patented, pending, abandoned)

(Application Serial No.)

(Filing Date)

(Status)
(patented, pending, abandoned)

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith.

See Attachment

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at telephone No. (412) 355-6500 C. R. Ethridge Phone No. (412) 355-8619

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Inventor's signature <i>Wen-Shi Huang</i>	Date Sep. 13, 2000
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Post Office Address The same as above	
Full name of second joint inventor, if any Lin Kuo-Cheng	
Second Inventor's signature <i>Lin Kuo-Cheng</i>	Date Sep. 13, 2000
Residence No.31-1, Shien Pan Rd., Kuei San Industrial Zone, Taoyuan Hsien, Taiwan, R.O.C.	
Citizenship A citizen of Taiwan, R.O.C.	
Post Office Address The same as above	

(Supply similar Information and signature for third and subsequent joint inventors.)

000001-40E58960

(Supply similar Information and signature for third and subsequent joint inventors.)

ATTACHMENT

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